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REVIEW

Patient Satisfaction in Teledermatology: an Updated Review

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Abstract

Purpose of Review Teledermatology continues to gain popularity across the world. It is crucial that dermatologists understand patient experience and satisfaction to effectively incorporate this practice into patient care. This article provides an updated review of recent findings on patient satisfaction in teledermatology.

Recent Findings Over the last 2 years, there has been an increase in studies on the patient experience of live-video teledermatology, while previous studies largely focused on store-and-forward teledermatology. This reflects the expansion of live-video teledermatology since the COVID-19 pandemic. Patients are generally very satisfied with both store-and-forward and live-video teledermatology, valuing its accessibility, quality of care, and patient-provider relationship. Decreased patient satisfaction is linked to technical difficulties, privacy concerns, lack of procedure availability, and thorough physical exams. However, teledermatology experiences are not equal across demographic groups. Access to technical support, digital literacy, age, social economic status, and type of dermatological conditions have all been found to affect patient experience.

Summary Studies show high levels of patient satisfaction in teledermatology but limitations exist. Future efforts to improve teledermatology experiences will require reducing barriers among demographics, improving patient education, investment in technology, and collaboration among all parties involved.

Keywords Teledermatology · Patient satisfaction · Store-and-forward method · Live-interactive method · Digital divide

Introduction

Teledermatology is the practice of remotely seeing, diagnosing, and treating patients for dermatological conditions using technology. Technological advancements such as an increase in mobile phones/applications, handheld tablets, small dermoscopic attachments for smartphones, and cameras to three-dimensional imaging systems have enhanced the quality of telehealth [1]. Teledermatology was initially developed with the intent to overcome access barriers and extend care to rural and underserved communities [1, 2•]. As a result of the COVID- 19 pandemic, it is now widely implemented across the world, allowing providers to remain engaged remotely. A survey of 591 practicing US dermatologists showed 14.1% used teledermatology prior to the pandemic, compared with 96.9% during the pandemic. Fifty-eight percent of the respondents expected to continue using teledermatology after the pandemic. Live-interactive dermatology was used by 94.1% of the respondents [3]. Therefore, it is important for dermatologists to understand the benefits, barriers, and patients' experience/satisfaction to effectively incorporate teledermatology into patient care.

Most of the literature on patient satisfaction before the pandemic focuses on the store-and-forward method, with recent literature reporting more information on the patient experience of live-interactive teledermatology. Here, we review and discuss the definition, study methods, and recent findings of patient satisfaction in teledermatology for both modalities. We also provide insight from our own provider experiences. Finally, we discuss barriers and common concerns that negatively impact patient satisfaction.

Definition and Study Methods of Patient Satisfaction in Teledermatology

The definition of patient satisfaction in the literature varies significantly and covers different domains of patient experience. The broad definition includes accessibility, efficacy, quality of care, technical quality, interpersonal relationship,

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continuity of care, finances, future preference, and overall satisfaction [4••]. Most studies define and design patient satisfaction questions using one or several of the above reported domains. In general, the most investigated domains of patient satisfaction in teledermatology are accessibility, quality of care, patient-provider relationship/communication, technical quality, and overall satisfaction and/or future care preferences.

Most of the studies use questionnaires for patients to self-report. The measurement of patient satisfaction across studies is not consistent. The scales of answers range from 2-point qualitative measurements (yes/no, agree/disagree) to 10-point scales (from 1 to 10). The Likert 5-point score system ranges from strongly disagree to strongly agree and is most commonly used [4••, 5••]. Additionally, patient sample sizes vary greatly from as few as 10 to more than 5000 across different countries and regions, covering diverse patient populations. Very few studies provide statistical analysis; thus, it is challenging to draw definitive conclusions based on the currently available information.

Patient Satisfaction in Teledermatology: Store-and-Forward Method vs Live-Interactive Method

Most studies on patient satisfaction before the COVID 19 pandemic focused on store-and-forward teledermatology. A systematic review from 2010 to 2020 (pre-pandemic) that included literature from 9 different nations reported 23 studies that covered patient satisfaction in teledermatology. Twenty-one studies focused on the traditional form of teledermatology, the store-and-forward method. Only one study focused on the more modern live-interactive form of teledermatology, and another study compared all three modalities (store-and-forward, live-interactive, and face to face dermatology). Most studies assessed satisfaction using self-developed questionnaires. The definition of patient satisfaction included overall accessibility, efficacy, technical quality, and physical environment, but remained inconsistent across all surveys. Interpersonal manners, finances, and continuity were covered the least. All studies demonstrated overall patient satisfaction with most studies reporting positive scores, but only four studies provided statistical analysis [4••]. Patients who required frequent follow-up appointments, such as patients with acne, psoriasis, topical skin cancer therapy, wound monitoring, and post-procedural care, were often very satisfied with the store-and-forward method. Although, several studies reported that about 10–25% of patients have concerns over sending photos. Some feel uncomfortable or embarrassed to have photos taken, while others stressed concerns over social, religious, and privacy issues regarding images [4••]. Most patients agreed the store-and-forward method saved time and provided flexibility, but the majority of patients still chose in-person visits when given the option. These findings were corroborated in several studies. One study reported 42% of patients preferred to see a dermatologist face to face, and an additional 17% felt something was missing in teledermatology when compared with an in-person visit [4••]. This discrepancy may be related to the unavailability of immediate diagnostic/treatment procedures, and the lack of direct patient-provider interaction in teledermatology. Only one cross-sectional survey reported findings of patient satisfaction as it pertains to the live-interactive modality. Most patients were highly satisfied with the ease of the service, but more than half of the respondents still preferred in-person visits [6]. Perceptions regarding teledermatology prior to appointments were neutral and shifted to positive after the appointment. Lower satisfaction was attributed to technical difficulties and unsatisfactory physical examinations. Most participants were White, non-Hispanic, English-speaking females with access to personal devices [6].

Since 2020, more studies have investigated the patient satisfaction of live-video teledermatology, or the hybrid form, allowing us to compare the impact of different teledermatology modalities on the patient experience. A recent study aimed to characterize patient satisfaction with live-interactive visits during the COVID-19 pandemic across four surveyed domains (visit preparation, provider communication, physical examination, treatment/follow-up) [7]. Visit preparation included travel for in-person visits, uploading photographs, and downloading software for a live-interactive visit. Of the 602 respondents, greater than 70% indicated at least equal satisfaction compared with in-person visits across all domains. More than a quarter of patients were dissatisfied with the virtual physical examination, and 57.9% preferred in-person examinations. Male gender was associated with treatment plan/follow-up satisfaction. When compared to younger patients, patients greater than 66 years of age preferred in-person visit preparation, communication, and treatment plan/follow-up. New patients were less satisfied with teledermatology communication and the treatment plan/follow-up when compared to existing patients, but preferred teledermatology visit preparation. The authors suggested that this discrepancy may be due to the patients' unfamiliarity with teledermatology. The majority of respondents were between 18 and 45 years of age and 70.8% were White females [7].

A Dermatology Unit in Naples, Italy, reported findings from 252 patients who completed questionnaires regarding patient satisfaction with teledermatology in the form of video call visits, phone-based visits, and email support during the COVID-19 pandemic [8]. A high level of satisfaction using both video- and phone-based teledermatology services was found. Video-based visits were preferred over

phone-based visits, albeit the results were not significant. Younger populations were more satisfied with both video- and phone-based visits when compared to older patients who preferred face to face in-clinic visits. Although high satisfaction was found among all surveyed, most patients reported teledermatology to be less satisfactory than face to face visits [8].

Miller and Jones reviewed the literature on patient and provider satisfaction of live-video teledermatology from 2020 to 2022. A total of 15 studies on 7871 patients and 146 providers reported overall satisfaction with quality of care, increased access, and patient-provider relationship. While patients were generally satisfied with technical quality, providers were dissatisfied with video/photo quality. Both providers and patients agreed that the patients' needs were met via live-video teledermatology. Patients were satisfied with patient-provider relationship, accessibility, visit preparation, and discharge. Six studies reported high patient willingness to use teledermatology, while two studies reported low preference compared with in-person visit. Patients with low satisfaction scores were more likely to have experienced an unsatisfied virtual physical exam and technical difficulty ($P < 0.01$) [5••].

Overall, studies suggest that patients are satisfied with both the store-and-forward and live-interactive teledermatology services. The recent expansion of live-video teledermatology enables us to further understand the benefits and limitation of different teledermatology modalities in terms of patient satisfaction. Patients are generally satisfied with accessibility, convenience, and quality of care. However, teledermatology has its limitation. Technical difficulties, concern over privacy, lack of procedure availability, and limited physical exams have been shown to impact patient satisfaction. Live-video teledermatology seems to score better on patient-provider relationships. However, there are complaints from providers over the quality of video images. Despite high levels of satisfaction with teledermatology services, many patients still prefer in-person visits, a finding seen in various studies [3, 9] but post-pandemic studies have demonstrated increased preference and acceptance of patients for teledermatology.

The Digital Divide

Telemedicine was established with the intent to overcome access barriers and extend care to rural and underserved communities. However, recent studies have suggested that access to telemedicine appointments, as well as the experience of the virtual appointment itself, varies across demographic groups and is not equal.

The digital divide refers to varying utilization of technology among populations of diverse races/ethnicities and socioeconomic demographics. Variations are due to social, language, and financial barriers, but also include digital literacy and trust in technology [2•]. There are an estimated 21 million people in the USA who lack high-quality broadband access [2•]. This information suggests that even if patients have successful internet connection, the quality of the appointment itself may be impacted by the quality of internet service. In addition, many patients from underserved communities do not have access to high-quality video devices and rely on telephone-only remote visits. Furthermore, underserved populations often have lower digital health literacy and may have trouble navigating patient portals/mobile health apps. Studies show that adult patients who utilized video visits were more likely to be White males with higher median household incomes and less likely to be Black [9]. Non-English language has been associated with more than 50% lower telemedicine usage [2•].

One cross-sectional study aimed to examine the disparities in telemedicine satisfaction among older and non-White patients. Results demonstrated positive attitudes towards teledermatology, but reported decreased satisfaction and confidence [10]. Non-White race was associated with greater concerns for conversation privacy and inappropriate information access, while White race was associated with greater confidence in telemedicine diagnosis. Interestingly, while this study aimed to measure disparities in older and non-White patients, most participants were educated White, English-speaking females [10]. In a separate cohort study of 148,402 patients scheduled for primary care and subspecialty telemedicine visits, Asians were 31% less likely to use telemedicine and when compared to whites, Blacks were 35% less likely to have their video on [11].

A study comparing no-show rates for in-person visits in 2019 and telemedicine visits in 2020 showed that attendance was actually increased among African Americans, Latinos, and patients whose primary language was not English [2•]. Yet, other studies continue to suggest that telemedicine offerings do not fully span the divide in health care access for minority patients. One study showed that Black patients had a 0.6 adjusted odds ratio of accessing care through telemedicine compared to White patients, supporting that access to virtual care is not equal for certain populations [2•].

Incarcerated patients represent another group of the underserved population. The high disease burden of dermatological conditions, lack of access, and limited resources lead to further challenges when providing care for these patients. Based on our experience and previous studies, teledermatology provides a valuable tool to greatly increase the access and care efficiency for incarcerated patients, positively impacting their care in terms of timely diagnosis and treatment [12]. However, there is a definite need for more studies to evaluate the patient experience and satisfaction in this demographic.

The improvement and expansion of teledermatology could enhance the convenience of care for these traditionally underserved populations. Lower income individuals may have more difficulty taking time off work, finding healthcare, or accessing transportation to travel to a health care facility. Telemedicine can offer these patients clear opportunities for access to care [2•]. Mandates for policies to increase access to tools, portals, and broadband internet services, in addition to efforts aimed to decrease language barriers, are necessary in bridging the digital divide and increasing patient satisfaction.

Conclusion

Overall, studies confirm high levels of patient satisfaction with both the store-and-forward and live-video teledermatology modalities. Live-video teledermatology has the advantage of direct communication, thus improving the patient-provider relationship. However, the quality of video images is often subpar compared with high-quality store-and-forward images. Patient satisfaction is specific to age, technical skills, socioeconomic status, and health status. Patients with better health status, younger age, and more digital literacy and who required less frequent visits to dermatologists were more accepting of teledermatology. The unavailability of immediate diagnostic/therapeutic procedures, limited physical examinations, technical difficulties, and limited broadband access are all additional factors that negatively impact patient satisfaction in teledermatology. Moving forward, the integration of technical advancements such as dermoscopy, confocal microscopy, and advanced imaging poses great potential for the improvement of teledermatology and patient satisfaction. Common barriers that may influence provider satisfaction of teledermatology include low reimbursements, concerns regarding malpractice/liability, and government regulations [3]. These factors are less discussed in literature, but certainly warrant more investigation. Furthermore, the current literature may not represent "real times" as much of the information was obtained during a peak COVID-19 pandemic era. It will be interesting to compare the outcomes of similar studies in a post-pandemic era.

In summary, the acceptance of teledermatology and the satisfaction among patients and providers continue to grow. Efforts are needed to improve patient satisfaction and may require collaboration from all parties including government, health care organizations, providers, and patients.

Compliance with Ethical Standards

Conflict of Interest The authors involved with this journal-based activity have report no relevant financial relationships with commercial interest(s).

Human and Animal Rights and Informed Consent This article does not contain any studies with human or animal subjects performed by any of the authors.

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